

Gas Security of Supply Significant Code Review Updated Proposed Final Decision – Responses document

Response summary and Ofgem view

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Overview:

The aim of the Gas Security of Supply Significant Code Review (Gas SCR) is to reduce the likelihood, severity and duration of a gas supply emergency. We are aiming to do this by ensuring the market rules provide appropriate incentives on gas shippers to balance supply and demand.

Our updated proposed final decision is set out in a letter we have published alongside this document. The letter sets out our proposed reforms to the market rules that would apply if an emergency occurred. These reforms sharpen the incentives to provide secure supplies. We are consulting on a demand-side response (DSR) tender. This would provide a mechanism for large consumers to reveal the cost of interruptions to their gas supplies, and to contract to provide DSR services in a centralised way, to further boost security of supply.

This document summarises responses to our original proposed final decision and accompanying impact assessment. It sets out Ofgem's views on the issues raised, and developments we have made to our proposals in response to stakeholder feedback.

Context

We began our significant code review (SCR) into gas security of supply in January 2011. In November 2011 we published a draft decision to reform the commercial arrangements that would apply in an emergency. In July 2012 we published our proposed final decision. This decision reaffirmed the Authority's draft decision. At the same time we provided Government with our Gas Security of Supply (SoS) report assessing the risks and resilience of the gas market and considering some further measures that could enhance security of supply. Government has welcomed Ofgem's report and is considering whether further measures are necessary to support gas security of supply. Government and Ofgem both agree that efficient price signals are necessary to enhance security of supply and any further measures would be in addition to cash-out reform.

Since the publication of our proposed final decision, we have received a significant amount of feedback from stakeholders, via consultation responses and stakeholder meetings. In response to these developments, we engaged extensively with industry stakeholders to understand their concerns. Following this, we have made a number of changes to our intended reforms to the cash-out arrangements. Details of our updated proposed final decision and a consultation on the introduction of a System Operator (SO) run DSR tender are published alongside this document.

Associated documents

Updated Proposed Final Decision – Gas Security of Supply Significant Code Review, July 2013 (ref 128/13):

http://www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/GasSCR/Documents1/130723_GasSCR_upfd.pdf

Demand-Side Response Tender Consultation – Gas SCR, July 2013 (ref 130/13):

http://www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/GasSCR/Documents1/130723_GasSCR_DSRtender.pdf

Gas Security of Supply Report, November 2012:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=3&refer=Markets/WhlMkts/monitoring-energy-security/gas-security-of-supply-report>

Proposed Final Decision – Gas SCR, July 2012 (ref 111/12):

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=85&refer=Markets/WhlMkts/CompandEff/GasSCR>

Impact Assessment for the Proposed Final Decision – Gas SCR, July 2012 (ref 112/12):

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=91&refer=Markets/WhlMkts/CompandEff/GasSCR>

Draft Policy Decision - Gas SCR, November 2011 (ref 145/11):

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=46&refer=Markets/WholesaleMkts/CompandEff/GasSCR>

Initial Consultation - Gas SCR, January 2011 (ref 02/11):

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=1&refer=Markets/WholesaleMkts/CompandEff/GasSCR>

Launch Statement – Gas SCR, January 2011:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=2&refer=Markets/WholesaleMkts/CompandEff/GasSCR>

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Executive Summary

Rationale

The aim of the Gas SCR is to reduce the likelihood, severity and duration of a gas emergency. We are seeking to do this through reform of the market rules, “cash-out”, that would apply if an emergency occurred. This is to ensure appropriate incentives are put in place for gas market participants to provide secure supplies, and mitigate the risks of an emergency occurring.

Gas shippers who do not balance their supply and demand are subject to cash-out charges. Under current arrangements, cash-out prices would be frozen if a gas deficit emergency (GDE) occurred. The emergency would be managed by instructing gas supplies within GB to maximise flows and, where necessary, by interrupting supplies to consumers.

The decline in GB gas production has resulted in increased reliance on international gas markets to deliver security of supply to GB consumers. This exposes GB to a range of additional risks. Events which could lead to physical disruption of gas supplies to domestic consumers are highly unlikely, though their impacts would be severe. We consider that our current cash-out arrangements need to be reviewed to reflect GB’s increased dependence on imports.

In 2010 Ofgem published Project Discovery, which noted that the consequence of freezing the cash-out price is that the incentive to bring gas to GB could be weakened at precisely the time when it should be sharpest. Given increasing reliance on imports, managing an emergency by instructing domestic supplies to flow may mean that the severity or duration of an emergency may not be minimised should one occur.

Under current arrangements shippers would not face the true costs of an emergency if one occurred. The cost of interrupting firm consumers is not factored into the cash-out price that would be paid by shippers who do not provide sufficient supplies. This means that the risks of an emergency currently sit with consumers, and shippers do not factor the potential cost of interruption into their decisions.

Proposed Final Decision

We launched the Gas SCR in early 2011 to explore ways to improve the emergency arrangements. Having published a draft decision in November 2011, we published our proposed final decision in July 2012. The key elements of this decision were to:

- Unfreeze the cash-out price in the event of an emergency, but cap it at the estimate of the cost of interrupting domestic consumers (“Value of Lost Load” – VoLL) if firm consumers were curtailed.
- Make payments at domestic VoLL to interrupted firm consumers, to transfer risks from consumers to shippers.
- Limit shippers’ exposure to one day in the case of physical network isolation.

Our Response to Feedback

Since the publication of our proposed final decision, we have received a significant amount of feedback from stakeholders. We have carefully considered the arguments and have developed our updated policy taking on board many of the suggestions that have been made. This document sets out the feedback we have received, changes we have made to our proposals and areas where we have decided to maintain our previous approach.

Stakeholder feedback	Our response
Introduction of VoLL into cash-out arrangements could create distortions	We propose that the cash-out price should remain unfrozen throughout a GDE, and should not incorporate a cap, to reduce the risks of distortions.
Determining cost of interrupting large consumers	Large consumers are more able to participate in the wholesale market, and so reveal their cost of interruption through these interactions. We are exploring an SO-run demand-side response (DSR) tender to provide a market-based mechanism to incorporate the costs of interrupting large consumers into cash-out.
Determining cost of interrupting small consumers	We remain of the view that the cost of interruption for small consumers should be incorporated using an estimate of VoLL. We have revisited our calculation of VoLL and now conclude that it should be set at £14/therm.
Payments to consumers and transfer of risks of emergency to shippers	We will develop our detailed proposed code and licence modifications to strike a balance between avoiding disincentives on long shippers and paying consumers. We consider that shippers are better placed to manage risks of an emergency. Cash-out arrangements would incorporate payments to affected consumers in recognition of the service they provide to the system if they are interrupted.
Impact of our proposals	We have assessed comments on our Impact Assessment (IA) Remain of the view that our proposals for cash-out reform are in the interest of consumers. If a GDE occurred, under current arrangements or under our proposed reforms, it could carry financial risks for the gas market, including impacts on credit arrangements, and hence on market liquidity and competition. We have not produced a full IA or modelling at this time. Our next steps will include the production of a further IA to help inform a decision on the DSR tender.

1. Introduction

1.1. We have listened carefully to respondents, and have reviewed our proposed final decision. Our updated proposed final decision is set out in the letter published alongside this document. In response to stakeholder feedback, we set out changes which aim to address concerns raised in response to the proposed final decision.

1.2. We have considered the arguments made by stakeholders about the potential for VoLL to act as a “target price” if the market is approaching a gas deficit emergency (GDE). We have made changes to our proposals to reduce the role of domestic VoLL where we consider it appropriate to do so. We have also considered our calculation of VoLL in light of stakeholder feedback. We are also consulting on the development of an SO-run DSR tender, which could provide a market-based mechanism to price the interruption of large consumers into cash-out when interrupted. We have examined the responses on the impact assessment (IA) published alongside our proposed final decision. We remain of the view that our proposals for cash-out reform are in the interests of consumers.

Purpose of this document

1.3. This document:

- Sets out issues raised in response to the consultation on the proposed final decision, associated impact assessment and stakeholder working groups.
- Explains where we have made changes to proposals as a result of stakeholders’ views.
- Sets out areas where we have decided, on balance, to maintain the approach set out in our proposed final decision.

1.4. At this stage, we are not producing a full IA or producing further modelling work. We think it would be more appropriate to carry out a full assessment of the impacts to inform a decision on the DSR tender. This document discusses points raised in response to our previous IA, and presents our analysis of these issues. We will consider further impacts on our existing IA as appropriate, and we plan to produce a Final IA at a later stage.

Document structure

1.5. The remainder of this document is structured as follows:

- Chapter 2 summarises responses to our policy proposals under our proposed final decision, and provides Ofgem’s view on these.
- Chapter 3 summarises responses to the IA for the proposed final decision, and provides Ofgem’s view on these.

2. Responses to proposed final decision

Chapter Summary

This chapter summarises the responses received through consultation, sets out Ofgem’s view on these issues and describes developments we have made to our proposals in response to stakeholder feedback.

Rationale

Proposed final decision

2.1. Under the current arrangements, the cash-out price would be frozen in a GDE. This means that price signals may not reflect true market conditions, and so may not provide the right incentives. Whilst our analysis showed that the probability of a GDE is currently small, price signals could be more important in the context of increasing import dependence. Under current arrangements the emergency would be managed by instructing domestic gas supplies to maximise flows, which may no longer be sufficient.

2.2. Price signals should reflect all costs of balancing the system – including the interruption of firm consumers if an emergency occurred. This creates the appropriate incentives for shippers to procure sufficient gas to supply their firm consumers in an emergency and to take efficient actions to enhance security of supply – including, for example, signing their customers to interruptible contracts.

2.3. The aim of our proposals under the proposed final decision was to implement cash-out reform to create these appropriate incentives. We sought to achieve this by pricing-in firm consumer interruptions at an estimate of domestic Value of Lost Load (VoLL). This ensures that incentives created by the emergency cash-out regime are aligned with the costs of an emergency if one occurred.

2.4. In developing our proposals for cash-out reform, we recognised that capping cash-out at one day of network isolation left a gap in incentives, which may mean there could be merit in investigating further measures to enhance security of supply. In 2012, we provided a report to the Department of Energy and Climate Change (DECC) setting out possible further measures for consideration – one of which was a DSR tender.

Responses to proposed final decision

2.5. Respondents recognised the merits of improving the price signals in an emergency through changes that would allow cash-out prices to be unfrozen in a GDE. Some respondents agreed with the rationale for providing incentives through the cash-out mechanism to avoid the interruption of consumers in a GDE.

2.6. Many stakeholders noted that the GB gas market has performed well to date, and has provided secure supplies. They highlighted significant investment in import capacity over the past decade as UKCS production has declined. Several respondents shared the view that it was unlikely that cash-out reform would lead to substantial physical investment in security of supply. They argued that at present an emergency is a very unlikely event and so would be likely to be discounted when making investment decisions.

Ofgem view

2.7. Our proposals create appropriate market-based incentives to avoid a GDE, by ensuring that the cash-out price faced by short shippers in an emergency more closely reflects the true costs of a GDE. We agree that the GB market has performed well to date in providing security of supply. However, the market is changing, as the decline in UK continental shelf production leads to increasing reliance on international gas markets to deliver security of supply. We consider that it is appropriate to put in place incentives that reflect these changes. The strength of incentive from cash-out reform is dependent on the risk of a GDE occurring, and so this provides flexibility should market conditions change over time.

2.8. We remain of the view that the current market arrangements do not adequately reflect the true cost of an emergency if one was to occur. As a result, existing price signals and incentives are not appropriate. Changes to the emergency cash-out regime would act to enhance security of supply. Cash-out reform creates appropriate price signals should a GDE occur or become imminent, to attract gas priced up to the value consumers place on secure supplies. This should reduce the likelihood of an emergency occurring, and the duration or severity of a GDE should one occur.

2.9. Under current arrangements, the freezing of the cash-out price represents a flow in the market arrangements, as the price would not reflect the true value of gas during an emergency if one occurred. We maintain that the interruption of consumers is a balancing action, and so should be treated as such. This implies that the price of interruption should be reflected in the cash-out arrangements.

2.10. Revealing the cost of demand interruptions is key to achieving the aims of the Gas SCR as it allows for the appropriate price signals to be sent to the market, and ensures shippers face the full costs of an emergency. We are consulting on pricing-in the interruption of DM consumers via a centralised SO-run DSR tender. We consider that the principal purpose of the tender should be to reveal the cost of interruption for DM consumers and provide a route to market for them to offer DSR.

2.11. Under current arrangements, the risk of a GDE sits almost entirely with consumers, though consumers have little to no effective means of mitigating this risk. Pricing consumers into cash-out and making payments in respect of voluntary and involuntary DSR transfers a proportionate level of risk from consumers to shippers. Shippers are better placed than consumers to manage the risk of an emergency, and so should face incentives to do so in order to enhance security of

supply. We recognise that it may not be appropriate for shippers to bear the full risks and cost of a GDE, and so maintain our proposals to limit liabilities in the case of network isolation. We have sought to balance the interests of consumers in enhancing the security of gas supplies with the interests of shippers in not being exposed to an inappropriate level of financial risk. We believe our proposals are effective in striking this balance.

Cash-out reform

Proposed changes to emergency cash-out arrangements

Proposed final decision

2.12. Our proposed final decision set out our intention to reform the emergency cash-out arrangements in order to ensure that the cash-out price faced by short shippers in an emergency reflects the cost of interrupting firm consumers to balance the system. Our proposals would have set the short cash-out price at an estimate of domestic VoLL from the point at which the first firm consumer is interrupted up to the end of the emergency.

2.13. Our proposed final decision also set out proposals to ensure that consumers are paid for any involuntary DSR services that they provide if they are interrupted to balance the system in a GDE. We proposed that all consumers would be paid at domestic VoLL if they were interrupted in a GDE, but limited to one day in the case of network isolation.

Responses to proposed final decision

2.14. Some respondents agreed that there could be a case for reform of the current emergency cash-out arrangements, as a frozen cash-out price may not provide the correct signals or properly reflect the value of gas if an emergency occurred. Respondents had a strong preference for dynamic and market-derived cash-out prices, rather than an estimated VoLL. Many respondents expressed concern that a known VoLL would act as a target for traders in the market, and be likely to lead to more rapid escalation of prices, with traders targeting the VoLL level ahead of an emergency.

2.15. Respondents argued that the estimated VoLL was much greater than prices seen in the market previously, and did not consider that the market would ever reach those levels if a VoLL price was not imposed. Respondents also considered that it was inappropriate to apply VoLL based on domestic consumption to all consumers. In particular, respondents thought that it was inappropriate to apply domestic VoLL in stage 2, as no domestic consumers would be interrupted in stage 2 of a GDE.

2.16. Some stakeholders argued for an approach that separated VoLL from the cash-out mechanism, and made payments to interrupted consumers through a

separate mechanism. They thought that cash-out prices could be determined on the basis of market actions, with payments to consumers made through a separate mechanism. Stakeholders considered that this would ensure there would be no risk of VoLL distorting prices.

2.17. Some stakeholders have argued that if VoLL is to be incorporated into cash-out, more thought must be given to the point at which it would be removed from the market to facilitate a return to “normal” market conditions.

Ofgem view

2.18. We maintain the view that the current frozen cash-out arrangements do not provide appropriate incentives. Having listened carefully to respondents, we have made several changes which aim to address concerns raised with the proposals for cash-out reform under the proposed final decision. Our proposals remain based on the principle of unfreezing cash-out if an emergency occurred and incorporating the cost of interrupting consumers.

2.19. We have considered the arguments made about the potential for VoLL to act as a target. Competition in the market should create incentives to trade below VoLL. If a party could exercise market power, then they may be able to target VoLL. However, in such a situation, prices could theoretically be unlimited, and so a cap on prices may be beneficial. Further, ex-post regulatory safeguards – such as the regulation on wholesale energy markets integrity and transparency (REMIT) – are in place to provide for such behaviour to be investigated if it constitutes market abuse.

2.20. Nevertheless, we understand that this is a concern for stakeholders, and we acknowledge the advantages of market-revealed prices where these can be achieved. As a result, we have made changes to our proposals to reduce the role of domestic VoLL where appropriate.

2.21. In this update we propose that cash-out would be unfrozen throughout a GDE, rather than fixed at VoLL for the duration of firm consumer interruptions. As set out in our updated proposed final decision letter, cash-out for short shippers will be set at the greater of:

- the highest balancing action taken (which may include any exercised DSR); or
- System Average Price (SAP) plus the default system marginal price.

2.22. Ahead of a GDE and during stage 1, cash-out for long shippers will be set at the lesser of:

- the lowest priced balancing action taken; or
- SAP less the default system marginal price.

2.23. From stage 2 onwards, the cash-out price for long shippers will remain unfrozen and set dynamically at SAP.

2.24. Balancing actions incorporated into the system marginal price (SMP_{buy} and SMP_{sell}) calculations would include voluntary DSR exercised through the DSR tender, and involuntary DSR due to interruption as a result of firm load shedding or the initiation of network isolation. The cash-out price for short shippers would be set by the most expensive (ie marginal) action taken on the day. In the event of a GDE this is likely to be the most expensive interruption that takes place on a given day.

2.25. Maintaining an unfrozen cash-out price throughout a GDE allows the market to respond to changing conditions as the emergency progresses. It also means that it will be more difficult to guess the level at which the cash-out price will be set. This should reduce the potential for cash-out to act as a target price. Further, it may facilitate the timely recovery of the market to “normal” prices once the emergency is resolved. This is important because the issue causing the emergency could actually be resolved before the market is formally restored and the emergency is officially declared to be over. Under current arrangements prices remain frozen until the formal end of the emergency.

2.26. We have carefully considered the arguments in relation to the use of VoLL for non-daily metered (NDM) interruption. We have also evaluated alternative approaches such as relying solely on the DSR tender to set cash-out prices. We set out our views on the target price arguments above. At present NDMs would be unable to directly reveal their cost of interruption (as they will not be able to participate in the DSR tender). Firm consumer interruptions should be priced into cash-out prices, and so it is necessary to estimate the cost of interruption for those who cannot directly reveal this cost to the market. We remain of the view that it is appropriate to price NDM interruption into the cash-out mechanism using an estimate of their VoLL. This maintains the principle that cash-out prices should reflect the cost of balancing the system. This ensures that price signals and incentives reflect the value these consumers place on secure gas supplies.

2.27. Our proposals for cash-out reform also incorporate payments to affected consumers in recognition of the service they provide to the system when interrupted. These payments ensure that risk is transferred from consumers to shippers. This includes payments for those interrupted under the DSR tender and payments to those interrupted involuntarily during a GDE. However, we are mindful that a balance must be struck between reflecting the cost of interruption and avoiding distortions to the DSR tender when deciding what these payments should be. Further information and proposals are set out in the DSR tender consultation that accompanies this document.

2.28. We have considered alternative approaches that would separate payments to consumers from the cash-out mechanism. However, we are concerned that implementing cash-out reform without payments to affected consumers would result in weak incentives in an emergency. This is because overall net cash-out charges are likely to be positive on days when consumers are interrupted. If this surplus is not used to make payments to consumers, then it would be smeared back to shippers. This would dilute the price signal faced by short shippers through cash-out. We will consider the detail of how payments are made to consumers as part of our upcoming consultation on business rules.

Value of lost load

Proposed final decision

2.29. Our proposed final decision was to incorporate domestic VoLL into the cash-out arrangements. We proposed to set VoLL for all firm consumer interruptions at £20/therm. This was selected on the basis of a study carried out by London Economics¹ (LE), using the estimate corresponding to the willingness-to-accept (WTA) payment of a domestic consumer, for a 7-day outage, occurring once every twenty years, in winter. This is consistent with the European Gas Security of Supply Regulation². The per-day estimate was converted to a per-therm estimate using domestic annual average daily consumption.

2.30. We proposed to apply this level of VoLL to all firm consumer interruptions, to provide strong incentives for the discovery of the demand side through commercial interruptible contracts with large consumers whose cost of interruption is less than VoLL.

Responses to proposed final decision

2.31. Respondents raised several areas where they disagreed with the calculation of VoLL used in the proposed final decision (£20/therm). Some respondents expressed concerns with the methodology used by LE to calculate VoLL, noting it uses survey data rather than observations from market behaviour. They also noted that the results could be considered counterintuitive as the estimates of willingness-to-pay exceed the estimates of willingness-to-accept.

2.32. Stakeholders had concerns that the choice of outage frequency used to calculate VoLL (1-in-20 years) did not reflect the likelihood of an emergency as suggested by the modelling carried out for the proposed final decision IA. They thought that the estimate of VoLL should reflect the likelihood of interruption under current arrangements. Respondents also considered that the outage duration used in the VoLL calculation should reflect the expected duration of an NDM outage – and so should be at least 14 days.

2.33. Respondents argued that the per-day estimate of VoLL (~£30/day) should not have been converted to a per-therm figure using domestic annual average daily consumption. Respondents considered that an emergency is most likely to occur on a peak winter day, and so typical peak-day consumption should be used to convert the VoLL estimate to a per-therm basis.

¹ Available at:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=46&refer=Markets/WhIMkts/CompandEff/GasSCR>

² Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:295:0001:0022:EN:PDF>)

2.34. Stakeholders argued that it was inappropriate to apply VoLL to all consumers considering it was only estimated on the basis of domestic consumers. They argued that it was not appropriate to apply this VoLL figure to I&C consumers, as their cost of interruption is likely to differ substantially from that of a domestic consumer. They also thought that providing payments at VoLL would reduce the incentives for I&C consumers to agree interruptible contracts.

2.35. The NDM VoLL figure used in the proposed final decision was based on the VoLL of domestic consumers. Some stakeholders considered that any NDM VoLL should be a volume-weighted average of the VoLLs of both domestic and SME consumers.

Ofgem view

2.36. We have revisited our calculation of NDM VoLL and now conclude that it should be set at £14/therm. We consider that some points made by respondents are valid, though on other areas we think it is appropriate to maintain our previous approach.

2.37. The report by LE published alongside the draft policy decision sets out why WTA was chosen as the basis of the VoLL calculation. This was due to potential issues with the willingness-to-pay (WTP) portion of the study, which led to counter-intuitive results. LE hypothesise that this may be due to the difficulty participants in the study had in responding to infrequent hypothetical events and forming preferences over very long time periods. We consider that a stated preference approach is necessary to estimate the costs of interrupting NDM consumers, as they do not directly interact with the wholesale market and so they are unable to reveal their cost of interruption through direct market transactions. We remain of the view that LE's approach to the study is appropriate.

2.38. We also think it is appropriate to determine VoLL on the basis of the security standards in the European Gas Security of Supply Regulation with which GB must comply. This sets the incentive to provide security of supply up to the level that consumers are willing to accept for interruptions in line with that standard. As consumers value secure supplies (corresponding to the EU standard) at VoLL, then shippers should be willing to purchase gas to maintain supplies to these consumers at prices up to VoLL. We are aiming to determine a VoLL that applies in the event of a GDE; it is for the market to price-in VoLL with regard for the likelihood of a GDE occurring.

2.39. We agree with respondents that the use of average daily consumption in the calculation of VoLL may not be appropriate, given that consumer preferences were estimated with reference to "winter". However, we do not consider it appropriate to utilise peak day consumption, as we do not think that participants in the study would have interpreted the description of "winter" as a peak day. In addition, it is not

certain at what point in winter an emergency may occur. As a result, we have decided to revise our calculation and utilise average daily winter consumption (which we estimate as 2.2 therms/day³). This results in an estimated domestic VoLL of £14/therm (based on a per-day estimate of £30/therm). Our estimate of VoLL remains within a range of VoLL calculated by previous studies.

2.40. We acknowledge that it may be preferable to factor large consumers into cash-out at prices derived with reference to their cost of interruption, and so our updated proposals incorporate a potential SO-run DSR tender to determine the cost of interrupting these consumers. We consider it remains appropriate to apply domestic VoLL to all NDM consumers subject to network isolation, as in the case of network isolation it is highly likely that domestic consumers will form the marginally-priced interruption. We have maintained our proposals to cap domestic VoLL at a single day, although network isolation would be likely to last multiple days. This recognises the need to strike a balance between fully cost-reflective prices and placing an appropriate level of risk on market participants.

Shipper response and DSR

Proposed final decision

2.41. Under our proposed final decision, we set domestic VoLL to apply to all consumer interruptions. The rationale for this was that domestic VoLL represented a proxy for the high end of the range of industrial and commercial (I&C) VoLLs. This maximised the potential for I&C consumers with costs of interruption below this level to agree commercial interruptible contracts with their shippers. Such interruptible contracts could be one form of response for shippers who are looking to mitigate the risks of a GDE.

Responses to proposed final decision

2.42. Respondents did not agree that consumers would be willing to sign commercial interruptible contracts with shippers. They considered that the default payment of VoLL at £20/therm would distort negotiations. Stakeholders considered that the prospect of payment at VoLL would lead to I&C consumers demanding payment for commercial DSR at greater than their cost of interruption, to reflect the cost of forgoing payment at VoLL. They also highlighted various hurdles that make such arrangements unattractive for consumers, and that many large consumers are unwilling to be interrupted for commercial reasons. Respondents noted that consumers may be more willing to agree to arrangements where interruption is directed by National Grid and only exercised if an emergency is imminent.

³ This was estimated using a five-year average of daily consumption between October and March for winters 2007-8 to 2011-12, with data derived from DECC Energy Trends table 4.1 (see: <http://www.gov.uk/government/organisations/departments-of-energy-climate-change/series/energy-trends>).

2.43. Some respondents considered that the proposed final decision could create the risk of moral hazard and adverse selection. Some shippers could choose to respond to the incentives created by cash-out reform and incur costs in doing so. Other shippers may choose not to respond to the incentives, and so may be able to undercut those shippers who had acted to improve security of supply. Some respondents also thought that cash-out reform would lead to shippers responding through taking out financial insurance rather than investing in physical security of supply.

Ofgem view

2.44. We are committed to exploring the use of a SO-run DSR tender to determine the VoLL of large consumers and payments to those consumers that participate. This will provide a centralised approach to procuring DSR and discovering the cost of interruption for those who participate. Appropriate incentives should be in place for participants to bid at their true cost of interruption. To incentivise participation, our current proposal is that those who choose not to participate will not receive payments if they are involuntarily interrupted, but would benefit from not being interrupted until firm load shedding. We will develop the tender with the aim of ensuring these incentives are in place.

2.45. As the exercise of DSR tender bids will be treated as a balancing action, NGG will effectively take ownership of the gas which is used for the purposes of balancing the system. This means that incentives remain in place for shippers to arrange bilateral interruptible contracts with their consumers. If a shipper interrupts their consumer pursuant to such an arrangement, and notifies NGG, then the shipper can “sell-back” into the market the gas that the consumer would have taken, or can benefit from an improved imbalance position.

2.46. We note the view that some shippers may choose to take no action in response to incentives put in place by cash-out reform. These shippers would be taking on greater level of risk than those who do choose to take mitigating actions. It is for shippers to determine appropriate responses to incentives and appropriate management of risks – including whether they take action and what form this action takes. Cash-out reforms provide unfrozen price signals which would help to attract gas in tight markets – and this price signal is not dependent on risk mitigation measures taken by shippers.

Impacts on competition, risk and credit

Proposed final decision

2.47. In our proposed final decision, we took an approach to limit liabilities in the event of network isolation in stage 3, when sites are subject to physical network isolation. The reconnection of consumers following physical isolation could take a long time, because each consumer has to be visited individually to be safely re-connected to the network. This means that the duration of an outage due to network isolation is much more likely to be dependent on the speed at which distribution

companies can re-connect consumers than the speed at which shippers can recover supplies. As a result, we proposed that consumers subject to network isolation would only be factored into imbalance calculations, and paid at VoLL, for the first day in which they are subject to network isolation. This recognised that the duration of an outage due to network isolation was not within the control of shippers. By limiting liabilities in this way, we sought to create a proportionate transfer of risks from consumers to shippers.

2.48. We proposed that VoLL would continue to set the cash-out price for each day of an emergency where any consumer was subject to emergency interruption, up to the point at which the market is restored.

2.49. As payments to consumers would be funded through the cash-out mechanism, there could be scenarios whereby there are insufficient funds available from cash-out charges to make payments to affected consumers. Under the proposed final decision, we set out arrangements that would partially target any shortfall in funds at short shippers, based on the ratio of short shippers' imbalance volumes to the total volume of consumer interruptions. Any remaining shortfall would be recovered via the neutrality process – as would be the case for the recovery of the costs of any other balancing actions taken by NGG. The neutrality process spreads costs across industry based on throughput on the day in question. This would ensure that affected consumers would be paid in full in the event of emergency interruption.

2.50. Under the current industry arrangements, any non-payment of Energy Balancing Invoices by a shipper is recovered from all other shippers. We did not propose to make changes to these arrangements under the Gas SCR proposed final decision.

2.51. Our proposed final decision and associated IA acknowledged the potential impacts on financial risks and credit requirements as a result of cash-out reform. We noted that the risks and costs of an emergency under current arrangements sit largely with consumers, and the Gas SCR aims to transfer a proportionate level of this risk from consumers to shippers, as shippers are better placed to manage these risks.

2.52. We recognised that if a GDE occurred, shippers could face significant costs through the way the credit arrangements incorporate peak prices into security requirements. We stated that the risk of shipper default sits with the shipper community, and that shippers are best placed to review the credit arrangements and potentially propose changes.

2.53. Our modelling for the proposed final decision estimated that under our proposals for cash-out reform, the average total exposure of the industry as a whole would be £267m if a GDE were to occur.

2.54. In our proposed final decision, we also acknowledged that cash-out reform may lead to detrimental impacts on liquidity should an emergency occur, due to the

increased cost and risk of trading at high prices. We also noted that there could be consequential impacts on competition, but that these could either be positive (through improved efficiency in the allocation of costs and risk) or negative (through impacts on barriers to entry).

Responses to proposed final decision

2.55. Respondents argued that the impacts on risk and the potential liabilities should an emergency occur were substantial, and had not been given sufficient consideration in reaching the proposed final decision. Many stakeholders highlighted their view that the risk of financial distress should a GDE take place could cause significant unintended consequences. One respondent thought that if several shippers entered default positions it could make it difficult for the Energy Balancing Credit Committee (EBCC) to operate.

2.56. Respondents also focussed on the potential impact on credit arrangements should a GDE occur. They explained that once a cash-out price of VoLL had fed into security calculations, the required level of energy balancing security for market participants could rise to prohibitive and unmanageable levels. One respondent estimated that cash-out reform could lead to a 30-fold increase in energy balancing security levels and that security requirements could reach £10.8bn in the event of a GDE. This respondent also highlighted the importance of using up to date information in credit calculations, and suggested a review of the current credit arrangements may be needed.

2.57. Respondents argued that the above impacts would have negative consequences for liquidity, due to increased counterparty risk and collateral requirements increasing the cost of trading. They also considered that these effects could act as a barrier to entry, and that the impact on smaller shippers could be comparatively larger. Stakeholders thought that both of these impacts would reduce the level of competition in the market, potentially to the detriment of consumers.

2.58. Respondents had concerns with proposals that could target substantial costs through the neutrality mechanism. This could arise if there was a shortfall in funds to make payments to consumers or if a shipper defaulted on their balancing invoice. Stakeholders considered that this could create a disincentive to increase flows on the day of an emergency, as neutrality charges are based on throughput. However, in an emergency it is generally desirable for shippers to maximise the amount they flow onto the system. Respondents were also concerned about the financial impact of significant costs being socialised, and the risk of contagion should one shipper default trigger subsequent defaults.

Ofgem view

2.59. We note stakeholder concerns about the level of risk and potential liability, and have developed our proposals with these in mind. We remain of the view that it is appropriate to limit liabilities in the case of network isolation. Our proposals are now designed such that NDM VoLL will only feed into cash-out prices on days when

network isolation is initiated. In addition, isolated sites will only be accounted for in imbalances for the first day of network isolation. This means some risks of an emergency remain with consumers. We are aiming to strike an appropriate balance of risk between shippers and consumers.

2.60. We recognise that the costs of a GDE could be significant, whichever cash-out arrangements are in place. A GDE could have consequences for credit arrangements, liquidity and competition. High prices could increase both balancing security requirements, and collateral requirements for trading. In turn, this may increase the cost of trading and act as a barrier to entry – which may have consequences for liquidity and competition. We recognise that small shippers may be particularly affected by some of the impacts outlined above, but note that all shippers have access to measures that could allow them to mitigate these risks.

2.61. However, it is very important to highlight that under current arrangements there is no limit on the level that cash-out prices could reach before they are frozen, and so many of the potential impacts outlined by respondents could equally apply in the event of a GDE under current arrangements, in the absence of cash-out reform. For example, the cash-out price just before entry to stage 2 of a GDE could be set by a balancing action procured from a large consumer who participates on the OCM. This consumer could have a very high cost of interruption, and if their OCM offer at this level is accepted by NGG then the cash-out price could be frozen at this level. An assessment of the impact of the SCR proposals on credit is largely dependent on assumptions around the conditions that would apply were a GDE to occur under current arrangements – particularly the price at which cash-out would be frozen.

2.62. We have assessed the respondent's estimate of the impact of the SCR on energy balancing security. This is based on a comparison between 12-month peak prices for 2011 and potential peak prices under a GDE (£20/therm under the proposed final decision). The analysis assumes a linear relationship between aggregate security held and the peak price in the preceding 12 months – and so assumes a 30-fold increase in peak prices would lead to a 30-fold increase in balancing security held. Other examples of aggregate security holdings and associated peak prices suggest that the relationship between peak prices and security is not linear, and so we do not consider the estimate of the impact on security to be robust.

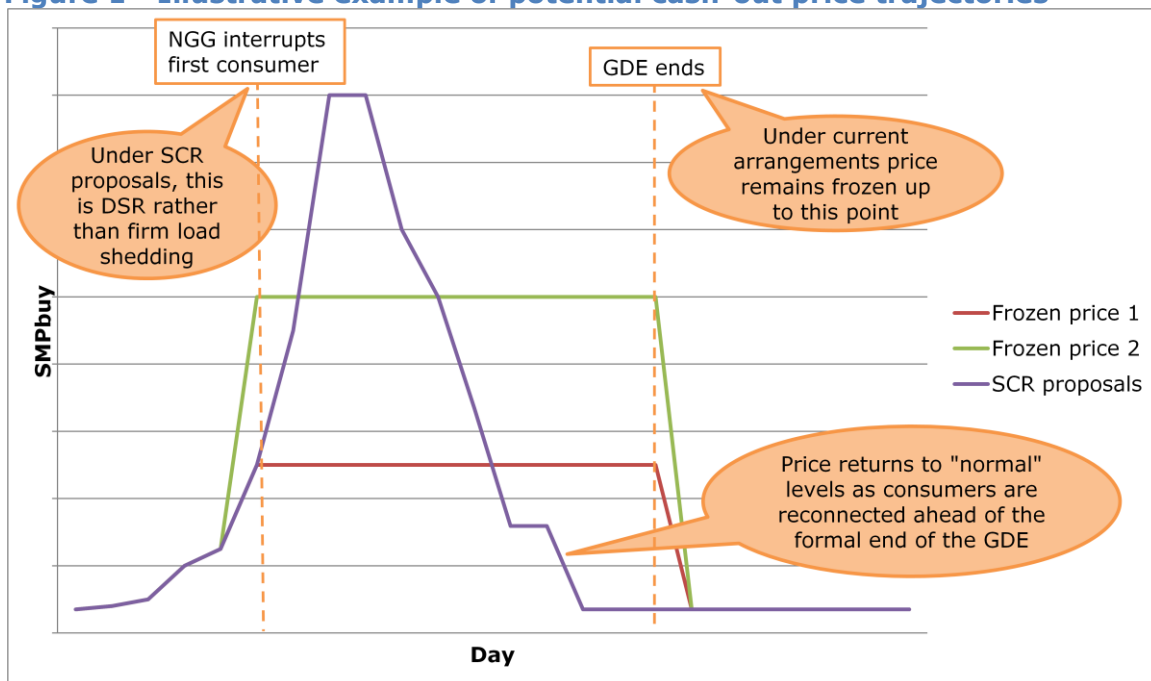
2.63. Further, the probability of a GDE occurring is very low. As a GDE has never occurred in GB we do not have historical evidence of their potential impacts. We do not think that it is valid to compare current levels of security under "normal" market operation (ie in years when no GDE has occurred) with a hypothetical example of security requirements under our SCR proposals in the event of a GDE.

2.64. Nevertheless, we recognise that the impact of a GDE on credit arrangements could be significant – whether under current arrangements or with cash-out reform in place. Such an increase in credit requirements would be reflective of the increased level of balancing charges as a result of the costs incurred when balancing the system in a GDE. We recognise that aspects of the current balancing credit arrangements may amplify the impacts of peak prices. We remain of the view that

industry participants are best placed to consider whether credit arrangements are fit for purpose in the case of a GDE. The Gas SCR places appropriate incentives on all shippers to mitigate the risks of a GDE. It reduces the likelihood of a GDE and so the likelihood of such impacts on the credit arrangements. Ofgem would give due consideration to any proposals to change the current credit arrangements.

2.65. Changes to our proposals facilitate an unfrozen cash-out price throughout a GDE. This could facilitate a faster return to “normal” prices once the emergency is resolved, without the need to wait for the formal end of an emergency. Under current arrangements prices would be frozen until the NEC declares that the emergency is over. The chart below provides an illustrative example.

Figure 1 - Illustrative example of potential cash-out price trajectories



Interactions

Proposed final decision

2.66. Under our proposed final decision, we noted the interactions that our Gas SCR proposals had with other aspects of the energy markets. In particular, we highlighted the interactions with further work on gas security of supply and the interactions with European gas markets and relevant European legislation. We also recognised interactions with electricity markets, including ongoing policy developments such as the Electricity Balancing SCR (EBSCR) and Electricity Market Reform (EMR). Also, following Ofgem’s report, Government announced in November 2012 that it intended to investigate possible further measures to enhance security of supply.

2.67. In developing our proposed final decision, we were mindful of these interactions and took measures to ensure our proposals took these interactions into account. For instance, we set VoLL with reference to the security of supply standard contained in the European Gas Security of Supply Regulation.

Responses to proposed final decision

2.68. Respondents highlighted several key interactions that they believed merited further consideration. Respondents noted interactions with neighbouring European markets, and highlighted correlation between prices in GB and continental European markets – which may mean that imports are not as responsive as assumed. Stakeholders also thought that distortions to EU gas flows created by the introduction of VoLL would be inconsistent with the third package⁴ or the European Gas Security of Supply Regulation. Some respondents highlighted specific interactions with interconnectors that exit the GB system at Moffat.

2.69. Many respondents raised the interactions with work on possible further measures to address security of supply in the gas market being considered by DECC, and expressed concern that cash-out reform could be implemented without full evaluation of the other options to improve security of supply. They thought that work on the SCR should not be progressed until DECC provided clarity on their intentions in relation to other security of supply measures in the gas market.

2.70. Some respondents highlighted the complex interactions between the electricity and gas markets, and in particular the ongoing policy initiatives in the electricity market which could have interactions with the gas market. Respondents particularly highlighted interactions with Electricity Market Reform (EMR) and the Electricity Balancing Significant Code Review (EBSCR) as areas where further consideration was needed.

Ofgem view

2.71. Ofgem and Government recognise the importance of cash-out reform in providing efficient price signals to the market. These price signals should correct the present weakness in market arrangements whereby prices do not reflect the true costs of an emergency. We both recognise that if Government was to proceed with a further intervention it would be in addition to cash-out reform.

⁴ The third package seeks to make the energy market fully effective and to create a single EU gas and electricity market. The package consists of two Directives, one concerning common rules for the internal market in gas (2009/73/EC), one concerning common rules for the internal market in electricity (2009/72/EC) and three Regulations, one on conditions for access to the natural gas transmission networks ((EC) No 715/2009), one on conditions for access to the network for cross-border exchange of electricity ((EC) No 714/2009) and one on the establishment of the Agency for the Cooperation of Energy Regulators ACER ((EC) No 713/2009).
(http://ec.europa.eu/energy/gas_electricity/legislation/third_legislative_package_en.htm)

2.72. In developing our policy, we have been mindful of the interactions between the gas and electricity markets, particularly the range of incentives placed on gas-fired generation given their position as a consumer of gas and producer of electricity. Providing efficient price signals through gas cash-out reform ensures that decisions made in the electricity market factor in the price of gas security of supply. These considerations must be balanced against our view of what is proportionate to impose on shippers in the gas market. In developing the DSR tender, we will carefully assess these interactions. Incentives in the electricity market from the capacity mechanism and electricity cash-out could have a significant impact on the behaviour of gas-fired generators in the gas market. This is discussed in more detail in the consultation on tender design that accompanies this document.

2.73. Our reforms are concerned with ensuring that GB market prices reflect the value that consumers place on secure supplies. This ensures that price signals in GB are at the appropriate level and so cross-border flows will be based on these price signals. We have been mindful of EU legislation in developing our proposals, and consider our proposals are consistent with this.

2.74. We note the views that interconnector users should be subject to payments for involuntary interruption. DSR payments are intended to be made to end-consumers in recognition of involuntary DSR services. Additionally, we do not have legal vires that extend beyond GB, and so DSR payments cannot be made to consumers in other markets. As a result, interconnectors and storage sites are not included in arrangements for DSR payments in respect of involuntary interruption.

3. Responses on Impact Assessment for Proposed Final Decision

Chapter Summary

Respondents to our proposed final decision commented on the accompanying impact assessment. This chapter summarises these responses and sets out Ofgem's view on these issues.

Impact assessment for proposed final decision

3.1. Alongside our proposed final decision, we published a statutory impact assessment (IA). This IA set out key factors that were taken into account in reaching the proposed final decision. It aimed to identify the likely impacts, costs and benefits of the reform options we considered and compared these with the current arrangements. We evaluated both the quantitative results of economic modelling and a qualitative assessment of the impacts. This IA built on the Draft IA published alongside the Draft Policy Decision.

3.2. In the IA, we set out the complexities and difficulties in modelling low-probability, high-impact events. We set out that the qualitative arguments and economic rationale were also important in reaching our proposed final decision.

3.3. At this stage, we are not producing a full IA or producing further modelling work. We think it would be more appropriate to carry out a full assessment of the impacts to inform a decision on the DSR tender. This document discusses points raised in response to our previous IA, and presents our analysis of these issues. We will consider further impacts on our existing IA as appropriate, and we plan to produce a Final IA at a later stage.

Modelling

Proposed final decision

3.4. As part of our assessment of the impact of our proposed final decision, we commissioned Redpoint Energy to carry out economic modelling of the impact of our proposals. This used a stochastic model of the GB gas market. The model runs numerous simulations and produces statistics on the probability and expected size of a GDE under current arrangements and with the various reform options in place. A more detailed description of the model can be found in our proposed final decision IA and the accompanying Redpoint report.

3.5. Our proposed final decision IA set out feedback we had received from stakeholders, and changes we made to the modelling as a result of this feedback and updated information. We also set out the results of the modelling, which showed expected improvements in security of supply as a result of our proposals for cash-out reform.

3.6. The model does not account for expectations of rising gas prices. In reality, we would expect prices to rise proportionately in response to the potential interruption of firm consumers, and so potential for cash-out to rise to VoLL. As a result, we expected that the benefits suggested by the modelling are an underestimate of the true benefits of cash-out reform.

Stakeholder views

3.7. Stakeholders had views on the assumptions used in the modelling for the proposed final decision. Some respondents considered that the assumptions were too pessimistic in several areas, leading to understatement of the level of security of supply that the GB market currently provides. Stakeholders commented specifically on the following assumptions:

- The assumed infrastructure outage frequencies remained too pessimistic, despite some changes from the Draft IA.
- The modelling of storage did not reflect diversity of short- and mid-range storage sites.
- The assumed volume of CCGTs with distillate back-up was likely to be higher than is actually available.
- The use of 'Gone Green' demand forecasts may not have been the most likely scenario for future gas demand.
- The modelling did not account for stocks of gas at LNG re-gasification terminals, and the additional flexibility this could provide.
- The modelling underestimated the level of DSR available to the market under current arrangements, as it effectively assumed no self-interruption takes place in response to rising prices.
- The modelling overestimated the likely willingness of large consumers to offer DSR following cash-out reform.
- The assumptions about imports from continental Europe did not properly reflect the lack of price responsiveness from interconnectors.
- The modelling of storage did not respond to random shock events and so did not accurately reflect actual behaviour of storage.

3.8. One respondent also highlighted that modelling lacks foresight and so prices do not rise in anticipation of a possible GDE. They set out concerns that this does not provide a realistic depiction of likely market conditions in the approach to a GDE. They argued that they would expect prices to rise if the likelihood of a GDE occurring was materially greater than zero.

3.9. Some respondents argued that the modelling does not show improvements in security of supply for NDM gas consumers. One respondent highlighted that the improvement in security of supply for DM gas consumers and electricity consumers results from moving firm DM tranches to become interruptible, which reduces the level of firm DM demand and provides protection for firm gas-fired generators. Some respondents also argued that the modelling does not account for externalities, societal impacts or impacts on competition as a result of the proposals.

Ofgem views

3.10. The modelling produced for the proposed final decision makes necessary simplifying assumptions. We believe that these assumptions provide a reasonable representation of the GB gas market. The primary purpose of the modelling was to provide comparisons between different policy options. As consistent assumptions were applied to the modelling of each option, the accuracy of individual assumptions would be unlikely to have a material impact on comparative CBA outcomes.

3.11. Assumptions around infrastructure outages were calibrated to historical data where possible. We made changes to assumptions in response to feedback on our draft IA (published alongside our draft policy decision). Outages were modelled such that they rarely manifest as complete unavailability of a particular source of supply, as the model was also designed to capture shocks that partially reduce availability of a particular supply source. In addition, where various supply sources (such as short- and mid-range storage) are modelled as a block, the mean impact of an outage is smaller. The average impact of an outage in the modelled short-range storage block (which includes mid-range storage), reduced the capacity of the overall block by an amount which effectively represents an outage at a single storage site.

3.12. The assumed availability of distillate back-up for gas-fired generators is based on National Grid's winter outlook 2011/12.

3.13. We chose the "Gone Green" scenario as the basis for demand assumptions in the modelling. Demand forecasting is uncertain. However, we would expect that if demand for gas was greater, then the probability of a security of supply event, and so the benefits from the Gas SCR, would be greater.

3.14. We recognise that the modelling for the proposed final decision does not take account of gas stocks at LNG re-gasification terminals. We chose a simplified approach that represented LNG flexibility through the decision criteria for LNG shipments. These criteria were based on lagged prices. A more complex approach may provide a more accurate representation of the flexibility of LNG. However, we expect that security of supply effects from this would apply equally under current arrangements and our proposed reforms.

3.15. The model effectively assumes that I&C consumers do not directly face the day-ahead price, and so assumes that there is no DSR available from this sector under current arrangements. It is important to point out that the model does capture DSR from gas-fired generation under current arrangements. The assumed

change in availability of DSR from I&C consumers in the model is used as a proxy to represent the range of responses to cash-out reform that shippers could choose to take. We would argue that it was a reasonable assumption that more I&C consumers would be willing to provide DSR following cash-out reform. The potential introduction of an SO-run DSR tender could also act to encourage DSR.

3.16. Interconnector flows in the model are calibrated to actual historical data, and so the modelled relationship between prices and flows from continental Europe is similar to the current relationship.

3.17. In the model, storage decisions are modelled taking into account volumes of gas in store, time of year, and expected forward prices. As a result, the price at which storage flows would increase during a 'tight' winter, due to the influence of decreasing volumes of gas in store.

3.18. As set out in our proposed final decision IA, the modelling does not incorporate foresight. However, it does incorporate escalation of prices due to scarcity – for example through the modelling of storage described above. We acknowledge that in reality expectations and foresight may mean that prices rise ahead of an emergency above the levels shown in the modelling. If the expected risk of an emergency is materially greater than zero, then we would expect market participants to price-in this risk. This may mean that actual prices are greater than those indicated by the modelling. However, we expect that rising prices in anticipation of a potential GDE would provide substantial additional security of supply benefits above those shown in the modelling. This is because rising prices would provide an earlier and stronger price signal ahead of a GDE than that produced in the modelling, and so should act to reduce the likelihood of a GDE occurring further (by, for instance, attracting marginal sources of supply that avert a GDE).

Cost Benefit Analysis

CBA

Proposed final decision

3.19. The CBA in the proposed final decision IA incorporates the following elements:

	Cost Item	Description
Supplier Welfare	Cash-out liability (1)	Change in cash-out liability faced by shippers
	Payments to interruptible customers (2)	Change in level of payments to interruptible consumers
	Change in total cost of gas (3)	Change in the total cost of gas supplied to GB market
	Retail revenue (1+2+3)	Assume suppliers pass through additional costs to consumers
	Net supplier welfare	Assumed to be zero, as assume competitive market means suppliers make normal profits
Consumer Welfare	Retail Costs	Equivalent to retail revenue as set out above
	Payments for involuntary DSR services and voluntary interruption	Change in level of payments consumers receive if interrupted either voluntarily or involuntarily
	Load reduction to firm gas customers, firm electricity consumers and interruptible gas consumers	Change in energy unserved for consumers as a result of changes in security of supply and the fact that some consumers become interruptible.
	Net consumer welfare (ie net benefit)	Sum of three impacts on consumer welfare

3.20. The CBA was used to estimate a bill impact for a typical domestic household (calculated using the 'Retail Costs' item, and assumptions of average consumption). We estimated that the impact of our proposals for cash-out reform would be around £0.11/annum for a typical domestic consumer.

Stakeholder views

3.21. Some respondents argued that the SCR reforms do not represent value for money for consumers. One respondent considered that the value of the expected reduction in energy unserved for NDM consumers and the estimated retail bill impact implied that the improvements to security of supply came at a unit cost of £24/therm, and so greater than the value of gas to NDM consumers implied by the estimate of VoLL.

3.22. Some respondents argued that the impact of extreme gas prices on power prices had not been incorporated into the CBA. They thought that higher gas prices as a result of cash-out reform could lead to consequential higher power prices – and that this could have a detrimental impact. One respondent believed that this effect should have been incorporated into the CBA, given that benefits to electricity security of supply had been included.

3.23. One respondent cited a 2007 report by Oxera for the Department of Trade and Industry, noting that this suggested that cash-out reform was not an effective tool for improving GB security of supply.⁵ The respondent also suggested that the CBA should be limited to GB only, and should make adjustments to exclude revenues flowing overseas to fund increased imports.

Ofgem views

3.24. Under the current arrangements, almost all risks and costs of a GDE would be borne by consumers. If a GDE occurred, the costs to society and the wider economy would be substantial. It is appropriate to transfer a proportionate level of these risks to shippers, as they are better placed than consumers to take actions that mitigate these risks. The benefits quantified in the CBA are based on direct reductions in energy unserved implied by the modelling, and so do not include the wider societal benefits of increased security of supply – which are likely to be significant.

3.25. We consider that our proposals provide value for money for consumers. This is because domestic consumers receive greater benefits than simply the reduction in expected energy unserved. They also benefit from payments for involuntary DSR in the event they are interrupted. Those gas consumers who are also electricity consumers benefit from improvements in electricity security of supply resulting from improvements in security of supplies for gas-fired generators. Importantly there are also benefits for domestic consumers that we have not quantified. As outlined above, we expect that the effect of our reforms on expectations of cash-out prices would provide an earlier price signal than that captured in the modelling. Hence, this provides greater security of supply benefits than those quantified in the modelling. Our qualitative analysis suggests the overall benefits would be greater than those quantified in the CBA. Furthermore, industrial and commercial consumers also receive net benefits as a result of the reforms.

3.26. There is potential for changes in gas prices to feed through into electricity prices as a second order effect. However, these effects are not captured by the model as the model only has a limited representation of the electricity market. The model does not attempt to produce a full simulation of the electricity market which would be necessary to determine impact on power prices for the CBA.

3.27. We have reviewed the Oxera report cited by respondents. Oxera's analysis shows that sharpening cash-out incentives does appear to encourage investment in security of supply. This leads to a reduction in the expected level of emergency interruptions in the majority of the period modelled. However, Oxera do note that, in some of the years modelled, sharpening cash-out incentives appears to lead to increased probability of interruptions. Oxera explain that this is a consequence of the simplified nature of the storage modelling, and so that the simulation results may understate the contribution that effective marginal pricing makes to security of supply.

⁵ www.berr.gov.uk/files/file38980.pdf

3.28. Our CBA includes consideration of the change in total cost of gas flowing into the GB market. We developed our CBA to consider broad costs and benefits – as identifying the location of ultimate beneficiaries would be beyond the scope of the modelling.

Costs of DSR/shipper response

Proposed final decision

3.29. As part of the modelling for our proposed final decision IA, we made an assumption that 27 mcm/d of I&C consumers would become interruptible as a result of cash-out reform. We assumed that the incentives created by cash-out reform would lead to shippers taking actions to mitigate the risk of a GDE. One possible mitigation measure would be to agree interruptible contracts with I&C consumers who have a VoLL of less than £20/therm. This would be rational, as these consumers would be willing to be interrupted in return for payment at their individual VoLLs, and shippers should be willing to pay up to £20/therm to mitigate the risks of being short in a GDE. However, we noted that shippers are best placed to judge the risks of a GDE and the costs of mitigating actions and act accordingly. For the purposes of modelling, we used these interruptible contracts as a proxy for the range of actions shippers could take, and assumed that consumers would be willing to agree interruptible contracts at their VoLL.

Stakeholder views

3.30. Stakeholders highlighted that they expect the costs of mitigating actions taken by shippers would be greater than those assumed in the CBA. Respondents argued that the costs of shipper response will be greater than the assumed proxy of increased commercial interruptible contracts. One respondent highlighted the default £20/therm for all firm consumers would increase the price of interruptible contracts above a consumer's VoLL. They expected that consumers would account for the alternative payment if they remained firm in deciding whether or not to become interruptible. This could mean that the costs of contracting for DSR may be significantly in excess of the costs set out in the CBA.

3.31. The respondent also suggested that National Grid's annual Operating Margins (OM) tender provides evidence of DSR potentially costing far more than Ofgem's initial estimates. The OM service is used to maintain system pressures and deal with locational issues in the period before other system management services become effective. The respondent summed the 'option' and 'exercise' elements of OM and multiplied by 10 million therms (27mcm) to produce an estimated average annual cost of DSR of £11.4m, which is greater than the £3.7m suggested in Redpoint's modelling.

3.32. One respondent thought that the estimates of the increase in availability of DSR may be over-optimistic. The respondent cited evidence from winter 2005/6 suggesting that as much as 15-20mcm/day of DSR was provided during Q1 by I&C consumers. They argued that this means that the 27mcm/day of DSR anticipated by

Redpoint's modelling is unrealistic, and that the assumption that there is no DSR available at present is incorrect.

3.33. The respondent also highlighted that a 2010 Pöyry report for DECC provided further evidence that the anticipated increase in DSR could be unrealistic, and that the assumption that there is no DSR available at present is incorrect. The respondent considered that the £20/therm cash-out price would only cause 15mcm/day of I&C demand to become interruptible based on Pöyry's assumptions.

3.34. Respondents argued that it would be unlikely that DSR would emerge at the levels and costs assumed under the proposed final decision. Stakeholders thought that shippers may take other actions to mitigate their risks – including the risks of price exposure associated with higher cash-out prices. One respondent highlighted that these actions could be costly, and could include measures that reduce shippers' risks but do not provide improvements in security of supply. These could include financial insurance or reservation of physical supplies or storage as contingency to be maintained in case of a GDE.

Ofgem views

3.35. We reiterate that the increase in DSR is a proxy for the range of responses shippers could take if they deem the risks of a GDE sufficient. Shippers are best placed to determine appropriate risk mitigation actions based on the incentives created by cash-out reform.

3.36. We recognise concerns that a default payment of VoLL for DM consumers would distort interruptible contract negotiations. We are consulting on a DSR tender to price-in DM consumers. We expect that consumers who are eligible for the DSR tender, but choose not to participate, would not receive payments. This means that large consumers will not have an alternative payment if they do not wish to provide DSR. This removes the potential for DSR prices to be distorted, and provides incentives for I&C consumers to provide DSR at their cost of interruption.

3.37. When utilising OM prices to estimate the cost of DSR, it is important to note the distinction between the 'option' and 'exercise' elements. The 'option' elements represent ongoing costs, but the 'exercise' elements are only incurred if the service is actually utilised. As such an estimate of annual cost of DSR based on OM information given the extent of interruptions in Redpoint's modelling would be significantly less than suggested by respondents.

3.38. However, there are important distinctions between OM and DSR. A significant proportion of OM comes from storage or arrangements to turn-up supplies, and so a limited amount of OM is made up of demand-side sources. The terms in OM and a DSR tender such as that being proposed will differ. In general, it seems the terms for OM contracts would be more stringent, and the contract more likely to be utilised. As such, it seems reasonable to assume that the option prices associated with a DSR tender would be similar to, if not below, those seen in OM.

3.39. Considering the availability of DSR, during winter 2005/6 there was substantial DSR from power generators and some from I&C consumers. The modelling captures DSR from gas-fired generation under both current arrangements and cash-out reform. We acknowledge that assuming no DSR is available at present from I&C consumers may not be fully accurate, and we acknowledge that consumers with prompt-indexed contracts may choose to self-interrupt in response to rising prices. The proposed final decision modelling effectively assumes that under current arrangements no I&C consumers are directly exposed to day-ahead prices and so do not face sharp incentives to self-interrupt as prices rise. This is a necessary simplifying assumption, and in reality some self-interruption may occur amongst I&C consumers.

3.40. We also recognise the uncertainty around the volume of available DSR. However, winter 2005/6 (as referenced by respondents) never saw NBP day-ahead prices rising above £1.80/therm – and no GDE was declared. It therefore seems reasonable to assume that prices approaching £7/therm may be likely to bring forward significant levels of DSR. The estimate that 27 mcm/d of DSR may be available at this price is based on the estimates of I&C VoLLs contained in the LE report. In our IA, we cited other indications that such a market could emerge – including the volume of interruptible capacity available under the regime that applied prior to the introduction of UNC modification 90.

3.41. We have also reviewed the Pöyry 2010 report referred to by one of the respondents. The report used different VoLL estimates, and so the assumptions are not directly comparable. Also, interruptible demand may have decreased in recent years since Pöyry published their report due to the continuing impact of UNC Mod 90 and the lack of incentives for shippers to offer commercial interruption on attractive terms. In fact, Pöyry state in their report that they expected this trend to continue unless changes were made. We do not consider that the Pöyry report supports the respondent's concerns about the amount of DSR we modelled as being brought forward by the reforms.

Costs of gas

Proposed final decision

3.42. As part of the CBA in the proposed final decision IA, we used the modelling to estimate the change in total cost of gas purchased by GB suppliers. This consisted of two elements. Firstly, when additional gas is imported to GB in response to the price signal created by cash-out reform, the cost of this extra gas is priced at the cash-out price. Secondly, in periods where the cash-out price rises sufficiently to trigger the interruption of I&C consumers, these tranches are interrupted and so gas is not purchased at prices above the VoLL of I&C consumers – an efficiency gain. The model implicitly assumed that suppliers are fully hedged by day-ahead close.

Stakeholder views

3.43. Stakeholders have highlighted that they expect the costs of gas both within and outside an emergency following cash-out reform will be greater than assumed in the CBA. Respondents highlighted several areas where the proposals would increase the gas price and so increase costs to shippers.

3.44. One respondent considered that when cash-out prices rise to VoLL during an emergency, prompt wholesale gas prices will also be at or around VoLL for the duration of the GDE. This means that any gas that suppliers purchase on the spot market during a GDE will be significantly more expensive after cash-out reform, a cost which is omitted from Redpoint's modelling. The respondent suggested as much as 15 to 20% of their supplies would be price exposed on a peak winter day and that these would therefore be purchased on spot markets.

3.45. As noted above, respondents argued that the potential for price rises ahead of an emergency is not captured by the modelling because of an assumption that traders do not have foresight. The respondent expects that prices will increase before a GDE as the probability of a GDE rises and will reach £20/therm when a GDE is certain. A similar de-escalation will potentially occur after a GDE. This will mean volumes supplied during those periods will be more expensive after cash-out reform compared to current arrangements.

3.46. One respondent uses modelling of a 5-day outage at the Kollsnes gas processing facility to illustrate the potential for expectations of the likelihood of an emergency to influence prices. They show prices increasing outside of an emergency when an outage increases the expected likelihood that an emergency will be declared.

3.47. Stakeholders highlighted that increases in prompt NBP prices could create additional costs even for those shippers who have fully secured sufficient gas to meet their obligations. This is because some contracts may be indexed to NBP prices. A respondent argued that prices would spike higher and take longer to return to normal than under current arrangements, potentially creating significant costs for the industry as a whole.

3.48. One respondent argued that cash-out reform may result in a general rise in NBP prices due to the re-pricing of force majeure risk. The SCR proposals do not contain force majeure provision. Stakeholders considered that this increases the risk of selling at NBP (which has no FM provision), and so suppliers would be likely to increase the price at which they are willing to sell at NBP. The respondent suggested this as being a uniform price increase across the forward curve between 0.25 and 1p/therm.

Ofgem views

3.49. We have made changes to our proposals that aim to provide a more flexible cash-out price by maintaining an unfrozen price throughout a GDE. This allows cash-out prices to respond quickly as the system recovers, and so ensures that high prices only persist for as long as is efficient. This reduces the risk of prolonged extreme prices and the associated impacts on costs for shippers.

3.50. In any case, we question whether spot or prompt market prices would necessarily be at or around VoLL throughout the proportion of a GDE where the cash-out price is set at these levels. Typically, correlation between SAP or SMP_{buy} and the day-ahead price diverges at points where SAP or SMP_{buy} prices spike.

3.51. We have limited direct knowledge of shippers' hedging strategies. However, we are not convinced that shippers would be price-exposed to the extent suggested by respondents. The proposed final decision modelling includes an implicit assumption that suppliers pursue a conservative approach and are fully hedged by day-ahead close. As such they would not be exposed to the divergence in spot prices. We are satisfied that this is a reasonable assumption given our understanding of the kinds of hedging strategies that market participants may be likely to pursue.

3.52. We acknowledge that the impact of cash-out reform on expectations could potentially increase prices ahead of a GDE. However, this would only occur if it is possible to foresee the likelihood of a GDE, and that traders are able to act on this information. The modelling makes the simplifying assumption that traders do not have foresight, and so are unable to act on changes in the risk of a GDE. We consider this is a necessary simplification given the difficulties and complex assumptions required to model foresight.

3.53. The illustration of a Kollsnes outage cited by a respondent sets out how we would expect the market to rationally behave when an event leads to an increase in the probability of a GDE occurring. The simulation shows prices returning to "normal" levels along fairly similar trajectories for both the "cash-out reform" and "current arrangements" scenarios modelled. We anticipate that the market would price in the expected cost of interruption in the approach to an emergency. This arises with the SCR because cash-out reform ensures that the value of security of supply is reflected in prices. Under current arrangements the emergency cash-out prices do not necessarily reflect the value of security of supply.

3.54. It is very important to note that there are significant security of supply benefits due to escalating prices ahead of a potential GDE. This is because these escalating prices will attract more gas into GB, reducing demand and providing strong incentives for shippers to balance. This could act to reduce the likelihood of a GDE occurring, and so provide security of supply benefits if the cost of a GDE is avoided. To the extent that rising costs are not captured by the modelling, the security of supply benefits are also not captured.

3.55. We acknowledge that contracts which are indexed to NBP prices may result in higher costs of gas for shippers, though it is for shippers to determine appropriate pricing structures when negotiating contracts and hedging strategies.

3.56. Ensuring the cost of a GDE is properly reflected in cash-out arrangements could lead to increases in wholesale prices, which recognise this increased security of supply. That increase is dependent on market participants' views of the likelihood of a GDE occurring. We question whether price rises due to the absence of an FM clause would be as suggested by respondents and note no material evidence has been provided in support of these estimates. Furthermore, it is unlikely that any price rises would be uniform along the curve as the respondent suggests, as we would expect price effects to be related to the likelihood of an emergency (eg vary between winter and summer). There are no FM provisions in the current cash-out arrangements and so the risk of an emergency is currently priced into NBP prices, although at expected cash-out levels under the current arrangements.

Appendices

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Appendix 1 – Summary of proposed final decision consultation and responses

Responses to our proposed final decision

1.1. In July 2012, we published our proposed final decision on the Gas SCR. We received 22 non-confidential responses. Respondents included gas shippers, storage operators, major energy users and the system operator. These responses are all published on the Ofgem website⁶. This appendix summarises responses to the proposed final decision.

Stakeholder views

1.2. Generally, many respondents recognised the merits of considering changes to the current emergency arrangements in the interest of security of supply. However, many respondents considered that the market has performed well to date, and so cautioned against radical changes. Several respondents highlighted the risks of unintended consequences and considered that these could outweigh the benefits of cash-out reform. Many respondents expressed opposition to cash-out reform as set out in the proposed final decision.

Need for change

1.3. Respondents recognised the merits of improving the price signals in an emergency through changes that would allow cash-out prices to be unfrozen in a GDE. Some respondents agreed with the rationale for providing incentives through the cash-out mechanism to avoid the interruption of consumers in a GDE. Several respondents shared the view that it was unlikely that cash-out reform would lead to substantial physical investment in security of supply.

Cash-out reform

1.4. Some respondents agreed that there could be a case for reform of the current emergency cash-out arrangements, as a frozen cash-out price may not provide the correct signals or properly reflect the value of gas if an emergency occurred. Respondents had a strong preference for dynamic and market-derived cash-out prices, rather than an estimated VoLL. Many respondents expressed concern that a known VoLL would act as a target for traders in the market, and be likely to lead to

⁶ Published responses can be found at the following link:
<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=85&refer=Markets/WhIMkts/CompandEff/GasSCR>

more rapid escalation of prices, with traders targeting the VoLL level ahead of an emergency.

1.5. Respondents argued that VoLL was much greater than prices seen in the market previously, and did not consider that the market would ever reach those levels if a VoLL price was not imposed. Respondents also considered that it was inappropriate to apply VoLL based on domestic consumption to all consumers. In particular, respondents thought that it was inappropriate to apply domestic VoLL in stage 2, as no domestic consumers would be interrupted in stage 2 of a GDE.

1.6. Some stakeholders argued for an approach that separated VoLL from the cash-out mechanism, and made payments to interrupted consumers through a separate mechanism. Cash-out prices could be determined on the basis of market actions, with payments to consumers made through a separate mechanism. Stakeholders considered that this would ensure there would be no risk of VoLL distorting prices.

1.7. Some stakeholders have argued that if VoLL is to be incorporated into cash-out, thought must be given to the point at which it is removed from the market to facilitate a return to “normal” market conditions.

1.8. Respondents raised several areas where they disagreed with the calculation of VoLL used in the proposed final decision (£20/therm). Stakeholders also considered that it was inappropriate to apply VoLL to I&C consumers. They highlighted that VoLL was estimated on the basis of domestic consumers, and the cost of interrupting I&C consumers is likely to be different.

Shipper response and DSR

1.9. Respondents did not agree that consumers would be willing to sign commercial interruptible contracts with shippers. They considered that the default payment of VoLL at £20/therm would distort negotiations. They also highlighted various hurdles that make such arrangements unattractive for consumers, and that many large consumers are unwilling to be interrupted for commercial reasons. Respondents thought that consumers may be more willing to agree to arrangements where interruption is directed by National Grid and only exercised if an emergency is imminent.

1.10. Some respondents considered that the proposed final decision could create the risk of moral hazard and adverse selection. Some shippers could choose to respond to the incentives created by cash-out reform and incur costs in doing so. Other shippers may choose not to respond to the incentives, and so may be able to undercut those shippers who had acted to improve security of supply. Some respondents also thought that cash-out reform would lead to shippers responding through taking out financial insurance rather than investing in physical security of supply.

Impact on risk, competition and credit

1.11. Respondents argued that the impacts on risk and the potential liabilities should an emergency occur were substantial, and had not been given sufficient consideration in reaching the proposed final decision. Many stakeholders highlighted their view that the risk of financial distress should a GDE take place could cause significant unintended consequences.

1.12. Respondents also focussed on the potential impact on credit arrangements should a GDE occur. They explained that once a cash-out price of VoLL had fed into security calculations, the required level of energy balancing security for market participants could rise to prohibitive and unmanageable levels. One respondent estimated that cash-out reform could lead to a 30-fold increase in energy balancing security levels and that security requirements could reach £10.8bn in the event of a GDE.

1.13. Respondents argued that the above impacts would have negative consequences for liquidity, due to increased counterparty risk and collateral requirements increasing the cost of trading. They also considered that these effects could act as a barrier to entry, and that the impact on smaller shippers could be comparatively larger. Stakeholders thought that both of these impacts would reduce the level of competition in the market, potentially to the detriment of consumers.

1.14. Respondents had concerns with proposals that could target substantial costs through the neutrality mechanism. This could arise if there was a shortfall in funds to make payments to consumers or if a shipper defaulted on their balancing invoice. Stakeholders considered that this could create a disincentive to increase flows on the day of an emergency, as neutrality charges are based on throughput. However, in an emergency it is generally desirable for shippers to maximise the amount they flow onto the system. Respondents were also concerned about the financial impact of significant costs being socialised, and the risk of contagion should one shipper default trigger subsequent defaults.

Interactions

1.15. Respondents highlighted several key interactions that they believed merited further consideration. Respondents highlighted interactions with neighbouring European markets, and expressed concerns that the proposed final decision could cause price contagion – which may mean that imports are not as responsive as assumed. Stakeholders also noted their view that distortions to EU gas flows created by the introduction of VoLL would be inconsistent with the third package. Some respondents highlighted specific interactions with interconnectors that exit the GB system at Moffat.

1.16. Many respondents noted the interactions with work on possible further measures to address security of supply in the gas market being considered by DECC, and expressed concern that cash-out reform could be implemented without full evaluation of the other options to improve security of supply. They thought that

work on the SCR should not be progressed until DECC provided clarity on their intentions in relation to other security of supply measures in the gas market.

1.17. Some respondents highlighted the complex interactions between the electricity and gas markets, and in particular the ongoing policy initiatives in the electricity market which could have interactions with the gas market. Respondents particularly highlighted interactions with Electricity Market Reform (EMR) and the Electricity Balancing Significant Code Review (EBSCR) as areas where further consideration was needed.

Modelling

1.18. Stakeholders had views on the assumptions used in the modelling for the proposed final decision. Some respondents considered that the assumptions were too pessimistic in several areas, leading to understatement of the level of security of supply that the GB market currently provides.

1.19. One respondent also highlighted that modelling lacks foresight and so prices do not rise in anticipation of a possible GDE. They set out concerns that this does not provide a realistic depiction of likely market conditions in the approach to a GDE. They argued that they would expect prices to rise if the likelihood of a GDE occurring was materially greater than zero.

1.20. Some respondents argued that the modelling does not show improvements in security of supply for NDM gas consumers. One respondent highlighted that the improvement in security of supply for DM gas consumers and electricity consumers results from moving firm DM tranches to become interruptible, which reduces the level of firm DM demand and provides protection for firm gas-fired generators. Some respondents also argued that the modelling does not account for externalities, societal impacts or impacts on competition as a result of the proposals.

Cost-Benefit Analysis

1.21. Some respondents argued that the SCR reforms do not represent value for money for consumers. One respondent considered that the value of the expected reduction in energy unserved for NDM consumers and the estimated retail bill impact implied that the improvements to security of supply came at a unit cost of £24/therm, and so greater than the value of gas to NDM consumers implied by the estimate of VoLL.

1.22. Some respondents argued that the impact of extreme gas prices on power prices had not been incorporated into the CBA. They thought that higher gas prices as a result of cash-out reform could lead to consequential higher power prices – and that this could have a detrimental impact. One respondent believed that this effect should have been incorporated into the CBA, given that benefits to electricity security of supply had been included.

1.23. Stakeholders have highlighted that they expect the costs of mitigating actions taken by shippers will be greater than those assumed in the CBA. Respondents considered that the costs of shipper response will be greater than the assumed proxy of increased commercial interruptible contracts. They considered that it would be unlikely that DSR would emerge at the levels and costs assumed under the proposed final decision. They also argued that shippers may also take other actions to mitigate their risks – including the risks of price exposure associated with higher cash-out prices. Respondents highlighted that these actions could be costly.

1.24. Respondents have highlighted that they expect the costs of gas both within and outside an emergency following cash-out reform will be greater than assumed in the CBA. Respondents highlighted several areas where the proposals would increase the gas price and so increase costs to shippers.

1.25. Stakeholders highlighted that increases in prompt NBP prices could create additional costs even for those shippers who have fully secured sufficient gas to meet their obligations. This is because some contracts may be indexed to NBP prices. A respondent argued that prices would spike higher and take longer to return to normal than under current arrangements, potentially creating significant costs for the industry as a whole.

Appendix 2 - Glossary

A

Authority (The)

The Authority is the Gas and Electricity Markets Authority (GEMA). GEMA is the governing body of Ofgem and consists of non-executive and executive members and a non-executive chair.

C

Cash-out

National Grid Gas is responsible for residual balancing of the gas system. The prices paid for these balancing actions are then passed onto long and short shippers. That is, long shippers are paid at one rate for their positive imbalance and short shippers have to pay at a different rate for their negative imbalance. These charges are known as cash-out prices.

Cash-out (dynamic)

Dynamic cash-out means that the level of the cash-out is unfrozen and continues to change in response to circumstances upon declaration of stage 2 of an emergency.

Cash-out (frozen)

Under current gas emergency arrangements the cash-out price is frozen when stage 2 of an emergency is declared. That is, the cash-out price remains at the level it was at this time for the duration of the emergency.

D

Daily-metered (DM) consumer

This is a gas consumer with a meter which allows their consumption to be measured on a daily basis.

Demand Side Response (DSR)

A demand side response is a short-term change in the use of, in this case, gas by consumers following a change in the balance between supply and demand.

E

Emergency curtailment arrangements

The emergency curtailment arrangements provide for payments to be made to shippers in the event that transporters instruct, under the direction of the Network

Emergency Coordinator, the curtailment of gas off-takes at any relevant supply point. Shippers are still required to pay cash-out on their imbalances but curtailed quantities are subject to a trade between the shipper and the residual balancer at the Emergency Curtailment Trade Price.

Emergency Curtailment Trade Price

This is the price at which a shipper's emergency curtailment quantity is paid. This is determined as the 30 day average System Average Price.

European Gas Security of Supply Regulation

Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC. This regulation aims to improve European gas security of supply, and places a number of requirements on member states.

Exit Reform

The Reform of the NTS Exit Capacity arrangements also known as Exit Reform began in 2005 following the Authority's decision to approve National Grid Gas's sale of four of its distribution network businesses. The process concluded in January 2009 with the implementation of code modification UNC195AV known as the Introduction of Enduring NTS Exit Capacity Arrangements.

The reform was necessary to ensure NGG received efficient investment signals in respect of NTS users' capacity needs under the new arrangements. This reforms process has also resulted in changes being made to the stages of a national gas deficit emergency.

F

Firm consumer

This is a consumer with a non-interruptible gas supply contract. These consumers cannot be instructed to reduce their demand or have their demand curtailed except for following the announcement of stage 2 or greater of an emergency.

Firm load shedding

Upon declaration of stage 2 of an emergency, the Network Emergency Coordinator may instruct transporters of gas to instruct consumers stop using gas. This is known as firm load shedding. Firm load shedding starts with the largest consumers – who are typically large industrial users or power generators.

Force majeure

Force majeure is a way in which parties to a contract can agree on specific circumstances when a failure to perform an obligation will be excused (ie when the breaching party will not face liability for its breach).

G

[The Gas Act \(1986\)](#)

The Gas Act is a piece of primary legislation that prohibits persons from engaging in specified activities unless authorised to do so by a licence granted by the Authority. The Gas Act also sets out the powers of the Authority in carrying out its functions under Part I of the Gas Act.

[Gas Deficit Emergency \(GDE\)](#)

A Gas Deficit Emergency is a type of Gas Supply Emergency arising as a result of insufficient deliveries of gas being available to meet required demand on the gas system or as a result of a potential or actual breach of a safety monitor.

[The Gas Safety \(Management\) Regulations 1996 \(GS\(M\)R\)](#)

The GS(M)R set out the requirement for a Network Emergency Coordinator (NEC) for any network which includes more than one gas transporter. They also require each gas transporter, as well as the NEC, to prepare a safety case which must be approved by the Health and Safety Executive.

[Gas Supply Emergency](#)

A Gas Supply Emergency is defined in the Uniform Network Code as the occurrence of an event or series of events that results in, or gives rise to a significant risk of, a loss of pressure in the gas system which may lead to a supply emergency.

H

[Health and Safety Executive \(HSE\)](#)

The Health and Safety Executive (HSE) is the national independent watchdog for work-related health, safety and illness. The safety case produced by the Network Emergency Coordinator must be submitted to the HSE for their approval.

I

[Interconnector \(Gas\)](#)

The gas pipelines and associated terminals which connect the European and UK gas transmission networks.

[Interruptible contract](#)

An interruptible contract may be signed by gas consumers where the relevant transporter and/or supplier have the ability to ask a consumer to reduce its off-takes (generally daily metered consumers). These contracts allow the transporter and/or supplier to disconnect the consumer (in or out of an emergency) in order to manage demand on the system. Consumers may sign these contracts in return for reduced rates on their gas supply.

L

[Licensee \(Gas\)](#)

The Gas Act requires parties involved in the gas industry to be licensed by the Authority. As licence holders, these parties are required to comply with a number of licence conditions.

[Licence condition](#)

All parties licensed by the Authority to partake in gas industry activities are required to meet certain licence conditions. The licence conditions for the gas industry are categorised into transporter, shipper, supplier and interconnector licence conditions. The licence conditions are separated into standard licence conditions which apply to all licensees of one type (eg transporters) and special licence conditions which apply only to a specific party (eg National Grid Gas).

[Liquefied Natural Gas \(LNG\)](#)

Liquefied Natural Gas is natural gas (predominantly methane, CH₄) that has been converted temporarily to liquid form for ease of storage or transport.

[Liquidity](#)

Liquidity is a measure of the number of times a given commodity is traded. A low liquidity can mean that it is difficult for new entrants to enter into and grow in a market.

[Local Distribution Zone \(LDZ\)](#)

Local Distribution Zones (LDZs) are low pressure pipeline systems which deliver gas to final users and Independent Gas Transporters. There are twelve LDZs which take gas from the high pressure transmission system for onward distribution at lower pressures.

M

[Market Balancing Action \(MBA\)](#)

An action taken by National Grid Gas to balance the system in which it enters into a transaction with a party so that that party will agree to make an acquiring or disposing trade nomination. The prices at which these trades are made set cash-out prices.

[Modification \(Code\)](#)

The Uniform Network Code (UNC) is the framework which sets out the gas transportation arrangements for those parties licensed under the Gas Act 1986. This code has developed through modifications raised by signatories to the UNC. It is still possible for modifications to be made through this industry led process. However, the introduction of the Significant Code Review process now allows for Ofgem to lead on the development of modifications before directing them to be raised.

N

[National Grid Gas \(NGG\)](#)

National Grid Gas (NGG) is the Gas Transportation licence holder for the North West, West Midlands, East England and London Gas Distribution Networks. NGG also hold the Gas Transportation licence for the gas National Transmission System (NTS). Prior to 10 October 2005, NGG was known as Transco.

[National Transmission System \(NTS\)](#)

This is National Grid Gas' high pressure gas transmission system. It consists of more than 6,400 km of pipe carrying gas at pressures of up to 85 bar (85 times normal atmospheric pressure).

[Network Emergency Coordinator \(NEC\)](#)

The Network Emergency Coordinator is responsible under safety legislation for the coordination of a gas supply emergency.

[Non-daily metered gas consumer \(NDM\)](#)

This is a gas consumer who does not have a meter which can be read on a daily basis. This includes small consumers, including domestic consumers.

[Neutrality](#)

This refers to the system of Balancing Neutrality Charges which are used under the Uniform Network Code (UNC) to ensure that National Grid neither benefits nor loses financially from the balancing actions it is required to undertake. The charges reflect the difference between all amounts received and paid by National Grid for gas used to balance the system and are spread across all signatories of the UNC on the basis of their usage of the transportation system.

O

[On-the-day Commodity Market \(OCM\)](#)

This is the market on which trading takes place to allow NGG to balance the system. Shippers may also trade with each other on the OCM.

P

[Post Emergency Claim \(PEC\)](#)

The post emergency claims arrangements are used to recompense parties for flowing additional gas onto the system in an emergency if opportunity costs for shippers to do so exceed the cash-out price they received for being long.

Project Discovery

Project Discovery is Ofgem's investigation published in 2010 into whether or not future security of supply could be delivered by the existing market arrangements over the coming decade. A copy of the report and associated documents can be accessed on our website.

Public Appeal

An appeal made by National Grid Gas to consumers in the event of a Gas Supply Emergency to reduce gas use.

S

Safety case

The Gas Safety (Management) Regulations 1996 set out the requirement for each transporter of gas to publish a safety case which must be approved by the Health and Safety Executive. These safety cases must demonstrate the method by which the holder will ensure the safe operation of its network. In the case of the Network Emergency Coordinator (NEC), the safety case includes details of the procedures that the NEC has established to monitor the situation throughout a supply emergency and for co-coordinating actions across affected parts of the gas network.

Safety and Firm Gas Monitor Methodology (Safety Monitor)

The Safety Monitor provides a requirement for sufficient gas to be held in storage to meet a number of criteria. This requirement remains valid in the event of a GDE.

Significant Code Review (SCR)

The SCR is a new modifications process introduced through the Code Governance Review. This process allows Ofgem to develop modifications proposals before directing them to be raised.

Shippers

Gas shippers buy gas from producers and sell the gas onto suppliers, and are defined as entity which introduces, conveys and takes out gas from a pipeline system.

Smeared/shared cost

This is a cost that is spread across all relevant parties. For example, the costs to National Grid of a certain activity may be spread across all shippers involved in the Great Britain gas market.

System Average Price

This is the weighted average price of all trades on a given day.

System Marginal Buy Price

The System Marginal Buy Price is the greater of the system average price plus the default system marginal price, and; the price of the highest balancing action offer price in relation to a Market Balancing Action taken by National Grid Gas for that day.

System Marginal Sell Price

The System Marginal Sell Price is the lesser of the system average price minus the default system marginal price, and the price of the lowest balancing action offer price in relation to a Market Balancing Action taken by National Grid Gas for that day.

System Operator

This is the entity responsible for operating the Great Britain transmission system and for entering into contracts with those who want to connect to and/or use the transmission system. National Grid is the GB system operator.

T

Therm

A unit of heating value equivalent to 100,000 British thermal units (Btu).

The Third Package

The Third Package is a key step in implementation of the internal European energy market. It recognises the need for better co-ordination between European network operators and continuing co-ordination between regulators at that level.

When discussing the 'Third Package' in this document we are referring to Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and to Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators.

Transporter (Gas)

The holder of a Gas Transporter's licence in accordance with the provisions of the Gas Act 1986.

U

Uniform Network Code (UNC)

The UNC defines the rights and responsibilities for all users of gas transportation systems in Great Britain. The UNC is, in effect, a contract between the gas transporter and the users of its pipeline system.

Uniform Network Code (UNC) – Section Q

Section Q of the UNC is the main framework which sets out the arrangements that will be in place in the event of declaration of a gas emergency.

V

Value of Lost Load (VoLL)

This is the theoretical price at which a consumer would rather have their gas supply disconnected than continue to pay for a firm supply.